

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A mouthguard to protect an arch of a user comprising:

an outer wall covering a buccal surface of teeth in the arch of the user ~~a tooth~~, wherein said outer wall includes a force absorbing inner layer, a force absorbing outer layer, and a force transmitting layer positioned therebetween said force absorbing inner layer and said force absorbing outer layer and said force transmitting layer is generally planar and includes a predetermined arrangement of fibers bonded together;

an inner wall opposite said outer wall covering a palatal surface of ~~the teeth in the arch of the user~~ teeth, wherein said inner wall only includes said force absorbing inner layer and said force absorbing outer layer; and

a lower wall connecting ~~disposed between~~ said outer wall with ~~and~~ said inner wall and covering an occlusal surface of teeth in the arch of the user ~~the teeth~~, wherein said lower wall only includes said force absorbing inner layer and said force absorbing outer layer and said outer wall, inner wall and lower wall form a U-shaped channel that is molded in the shape of the arch of the user to distribute an applied force through the force transmitting layer transversely across only the buccal surface of the teeth, ~~wherein said lower wall includes said force absorbing inner layer and said force absorbing outer layer.~~

2. (Currently amended) A mouthguard as set forth in claim 1 wherein said force transmitting layer includes of a plurality of longitudinally extending fibers disposed in a resinous matrix to distribute a shear force over the length of the fibers.

3. (Original) A mouthguard as set forth in claim 1 further comprising a palate protective wall extending radially from an edge of said inner wall, wherein said palate protective wall conforms to a shape of a palate of the user.

4. (Currently amended) A mouthguard as set forth in claim 1 wherein said force absorbing inner layer and said force absorbing outer layer are made from a class of materials approved for dental use having resilient, moldable, and settable properties.

5. (Original) A mouthguard as set forth in claim 4 wherein said force absorbing inner layer includes a chemical additive enabling the material to be rigid below a first predetermined temperature and moldable above a second predetermined temperature that is greater than the first predetermined temperature.

6. (Original) A mouthguard as set forth in claim 4 wherein said force absorbing inner layer material includes a gas-liberating chemical additive that is selected from a class of additives that is chemically reactive upon the application of heat to liberate air bubbles that become trapped in the force absorbing inner layer material.

7. (Currently amended) A mouthguard as set forth in claim 1 wherein said force transmitting layer is made from a composite material selected from a class [[a]] of materials approved for dental use and having force transmitting properties.

8. (Original) A mouthguard as set forth in claim 7 wherein said composite force transmitting material includes a plurality of long fibers embedded in a resin matrix.

9. (Original) A mouthguard as set forth in claim 8 wherein said fibers are selected from a class of material that includes glass fibers, or carbon fibers or quartz fibers.

10. (Original) A mouthguard as set forth in claim 8 wherein said resin matrix is selected from a class of resinous materials including an epoxy resin, or a polyester resin or an acrylic resin.

11. (Currently amended) A mouthguard as set forth in claim [[7]] 1 wherein said force transmitting layer is formed as a strip.

12. (Original) A mouthguard as set forth in claim 11 wherein said strip is preformed.

13. (Currently amended) A mouthguard to protect an arch of a user comprising:
an outer wall covering a buccal surface of teeth in the arch of the user ~~a tooth~~, wherein said outer wall includes a force absorbing inner layer and a force absorbing outer layer that are each made from a class of materials approved for dental use having resilient, moldable, and settable properties, and a force transmitting layer positioned therebetween said force absorbing inner layer and said force absorbing outer layer, wherein said force transmitting layer is made of a plurality of longitudinally extending fibers disposed in a resinous matrix;
an inner wall opposite said outer wall covering a palatal surface of ~~the~~ teeth in the arch of the user ~~teeth~~, wherein said inner wall only includes said force absorbing inner layer and said force absorbing outer layer; and

a lower wall ~~connecting disposed between~~ said outer wall ~~with and~~ said inner wall ~~and~~ covering an occlusal surface of the ~~teeth~~ teeth, wherein said lower wall only includes said ~~force absorbing inner layer and said force absorbing outer layer~~ and said outer wall, inner wall and lower wall form a U-shaped channel that is molded in the shape of the arch; ~~wherein said lower wall includes said force absorbing inner layer and said force absorbing outer layer.~~

14. (Original) A mouthguard as set forth in claim 13 further comprising a palate protective wall extending radially from an edge of said inner wall, wherein said palate protective wall conforms to a shape of a palate of the user.

15. (Original) A mouthguard as set forth in claim 13 wherein said force absorbing inner layer includes a chemical additive enabling the material to be rigid below a first predetermined temperature and moldable above a second predetermined temperature that is greater than the first predetermined temperature.

16. (Original) A mouthguard as set forth in claim 13 wherein said force absorbing inner layer material includes a gas-liberating chemical additive that is selected from a class of additives that is chemically reactive upon the application of heat to liberate air bubbles that become trapped in the force absorbing inner layer material.

17. (Original) A mouthguard as set forth in claim 13 wherein said fibers are selected from a class of fibrous material includes glass fibers, or carbon fibers or quartz fibers.

18. (Original) A mouthguard as set forth in claim 13 wherein said resin matrix is selected from a class of resinous materials including an epoxy resin, or a polyester resin or an acrylic resin.

19. (Original) A mouthguard as set forth in claim 13 wherein said force transmitting layer is formed as a strip.

20. (Original) A mouthguard as set forth in claim 19 wherein said strip is preformed.

21. (Withdrawn) A method of making a mouthguard for a user, said method including the steps of:

casting a model of a user's arch;

molding a force absorbing inner layer of material to the model to form a force absorbing inner layer of the mouthguard;

molding a force-transmitting layer of material over the force absorbing inner layer in a predetermined position, wherein the force transmitting layer includes a plurality of longitudinally extending fibers disposed in a resinous matrix;

molding a force absorbing outer layer of material over the force absorbing inner layer and force transmitting layer to form a mouthguard having an inner wall covering a palatal surface of a tooth, an outer wall opposite inner wall covering a buccal surface of the tooth and a lower wall disposed therebetween the inner wall and outer wall covering an occlusal surface of the tooth; and

finishing the mouthguard to conform to the arch of the user.

22. (Withdrawn) A method as set forth in claim 21 further comprising the step of using a sizing device to determine the size of mouthguard to use, wherein said sizing device includes a u-shaped bite member having a handle extending from an edge, and a plurality of arch shapes indicated on a surface of the bite member corresponding to a mouthguard size.

23. (Withdrawn) A mouthguard as set forth in claim 21 wherein said fibers are selected from a class of fibrous material including glass fibers, or carbon fibers or quartz fibers.

24. (Withdrawn) A mouthguard as set forth in claim 21 wherein said resin matrix is selected from a class of resinous materials including an epoxy resin, or a polyester resin or an acrylic resin.

25. (New) A mouthguard as set forth in claim 1 wherein said force transmitting layer extends between a first molar on one side of the arch of the user and a first molar on an opposite side of the arch of the user, and covers an incisal to a cervical portion of the teeth between the first molar on one side of the arch and the first molar on the opposite side of the arch.

26 (New) A mouthguard as set forth in claim 13 wherein said force transmitting layer extends between a first molar on one side of the arch of the user and a first molar on an opposite side of the arch of the user, and covers an incisal to a cervical portion of the teeth

between the first molar on one side of the arch and the first molar on the opposite side of the arch.